South Carolina Department of
Natural Resources

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October 20, 2017

Mr. Joe Koon
SCDHEC
BLWM/DMSWM
2600 Bull Street
Columbia, SC 29201-1708

REFERENCE: Mining Application # I-002171, RDA LLC
RDA Mine, Williamsburg County

Dear Mr. Koon:

Personnel with the South Carolina Department of Natural Resources (SCDNR) have reviewed the proposed project, including a site visit with the applicant's agents on October 9, 2017, and evaluated its impact on natural resources. As such, SCDNR offers the following preliminary items of concern.

Project Description
The proposed mine is located approximately 5 miles northwest of Andrews near the intersection of US 521 and Jumping Run Road in Williamsburg County. The applicant proposes to mine limestone from a 622.7 acre affected area. The proposed site also includes 158.1 acres of future impacts/reserves and 187.6 acres of undisturbed buffers for a total permitted area of 968.4 acres. The average depth of mining will be approximately 55 feet from the ground surface with a maximum depth of 65 feet and a maximum pit floor elevation of 21 feet below mean sea level. The proposed mine will involve the pumping of groundwater and require a NPDES permit for point source discharge. The application states that jurisdictional wetlands will be affected, but mine plans are to first avoid wetlands. The information provided indicates that there are 92.8 acres of jurisdictional wetlands and 25.47 acres of isolated wetlands on the tract. The applicant has submitted a request for a jurisdictional determination to the U.S. Army Corps of Engineers. The wetlands outside the proposed disturbance areas are planned for protection with a 50-foot (typical) upland buffer. A proposed reclamation plan has been submitted, indicating the site will be restored to lakes and grasslands after mining.

Agency Concerns
Isolated wetlands, as those found on the site, provide important habitat for herpetofauna for breeding and foraging, as well as provide source water for other wildlife. Wetlands function to provide nutrient cycling, filtering water and improving its quality, as well as serves a sink to promote groundwater recharge. Excavating around the wetland areas on the mining site will likely lead to degradation of these important functions as a result of the lowering of groundwater elevations.

Due to the nature of limestone interacting with groundwater, SCDNR has concerns regarding the projected groundwater withdrawals, inducing sinkholes. If a sinkhole should open, it could harm the wetland avoidance and buffer areas, as well as surrounding properties. Our review of the Hydrogeologic Evaluation document (Appendix D) reveals that the pump tests indicate a leaky aquifer condition and Figure 6 shows potential existing karst features within, and near, to the proposed mine area. If the overlying Pleistocene sediments are in hydraulic connection with the limestone, as proposed

in the preliminary hydrologic testing, and the groundwater levels are lowered for mining, there is risk of sinkhole reactivation or formation. This could occur by the removal of water from known and unidentified dissolution cavities within the limestone.

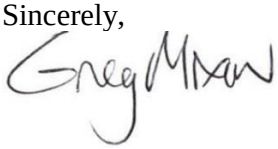
The total removal of water or lowering of its head pressure within the limestone could weaken it and foster collapse. Thence, the overlying unconsolidated sediments could then flow into the cavities and cause surface collapse. This is the model used to describe the induced sinkholes that occurred in Georgetown, SC in 2011. In Georgetown, a dewatering project lowered the head pressure in the same geological unit this mine proposes to excavate. Prior to pumping, the hydrostatic head was above the elevation of the limestone. Therefore, the water was pushing up on the overlying materials; head pressure in the limestone was partially supporting the overlying unconsolidated sediments. When the head pressure was lowered, the limestone collapsed under the weight of the overlying material and the sediments flowed downward into the cavities. If the material on the proposed mine site is under similar hydrostatic head conditions (a positive head elevation higher than the upper elevation of the limestone), then a similar condition with its associated risks could occur.

Additionally, SCDNR has concerns regarding the potential for significant water quality impacts to Murray Swamp associated with the use of the existing road crossing and the proposed location of the process plant, shop and equipment storage areas. Murray Swamp is a tributary to the Black River, a State Scenic River, located approximately 6 miles downstream from the site. Volatile organic compounds, dust and other pollutants from these areas could adversely impact downstream water quality and aquatic life if these areas are not adequately buffered and managed. Water quality data from the SCDNR State Stream Assessment indicates the pH of the water in Murray Swamp is already close to the upper (more alkaline) tolerance thresholds for water tupelo and bald-cypress. Substantial limestone dust or mine runoff inputs to Murray Swamp would likely result in increased mortality of these dominant tree species and should, therefore, be minimized. The construction of a new road crossing, if required, will result in direct fill of wetlands in Murray Swamp as well as significant habitat loss due to the segmentation of the swamp and impacts to hydrologic flow and connectivity.

SCDNR recommends that the above concerns be researched and addressed prior to the issuance of any federal or state permits and certifications. SCDNR reserves the right to provide additional comments and will provide a final permit recommendation as more information becomes available regarding project impacts, details of operation or response to agency concerns.

Should you have any questions or need more information, please do not hesitate to contact me by email at mixong@dnr.sc.gov or by phone at 803.734.3282.

Sincerely,



Greg Mixon
Inland Environmental Coordinator